

Der Open-Access-Publikationsserver der ZBW – Leibniz-Informationszentrum Wirtschaft
The Open Access Publication Server of the ZBW – Leibniz Information Centre for Economics

Traistaru, Iulia

Working Paper

Transmission channels of business cycles synchronization in an enlarged EMU

ZEI working paper, No. B 18-2004

Provided in cooperation with:

Rheinische Friedrich-Wilhelms-Universität Bonn

Suggested citation: Traistaru, Iulia (2004) : Transmission channels of business cycles synchronization in an enlarged EMU, ZEI working paper, No. B 18-2004, <http://hdl.handle.net/10419/39537>

Nutzungsbedingungen:

Die ZBW räumt Ihnen als Nutzerin/Nutzer das unentgeltliche, räumlich unbeschränkte und zeitlich auf die Dauer des Schutzrechts beschränkte einfache Recht ein, das ausgewählte Werk im Rahmen der unter

→ <http://www.econstor.eu/dspace/Nutzungsbedingungen> nachzulesenden vollständigen Nutzungsbedingungen zu vervielfältigen, mit denen die Nutzerin/der Nutzer sich durch die erste Nutzung einverstanden erklärt.

Terms of use:

The ZBW grants you, the user, the non-exclusive right to use the selected work free of charge, territorially unrestricted and within the time limit of the term of the property rights according to the terms specified at

→ <http://www.econstor.eu/dspace/Nutzungsbedingungen>
By the first use of the selected work the user agrees and declares to comply with these terms of use.

Zentrum für Europäische Integrationsforschung
Center for European Integration Studies
Rheinische Friedrich-Wilhelms-Universität Bonn



Iulia Traistaru

**Transmission Channels of
Business Cycles
Synchronization in an
Enlarged EMU**

Working Paper

**B 18
2004**

**Transmission Channels of
Business Cycles Synchronization
in an Enlarged EMU**

Iulia Traistaru

University of Bonn, Center for European Integration Studies (ZEI),
Walter-Flex-Str. 3 D-53113 Bonn, Germany

Tel.: +49-228-73 1886
Fax: +49-228-73 1809
E-mail: traistaru@uni-bonn.de

July 2004

Abstract

The accession of Central European countries to the European Union implies the possibility of euro area membership once the Maastricht nominal convergence criteria will be met. This raises the question about costs and benefits of an enlarged euro area. In particular, the prospects for structural and cyclical convergence in an enlarged euro area have been little investigated so far. How synchronized are business cycles between the Central European new EU countries (CE-EU-8) and current euro area members? How is business cycles synchronization transmitted across these countries? This paper investigates the degree of business cycles synchronization between the current and future euro area member states over the period 1990-2003 and analyses the similarity of economic structures and bilateral trade intensity as main transmission channels. Using band-pass filtered GDP data, I find that business cycles between the CE-EU-8 countries and euro area members are less correlated in comparison to the current euro area members. In the group of the CE-EU-8 countries, over the analyzed period, business cycles in Hungary, Poland and Slovenia were closer correlated with the economic activity fluctuations in the current euro area members. The econometric analysis indicates that similarity of economic structures and bilateral trade intensity were positively and significantly associated with business cycles correlations. This result is robust to different groups of country pairs and estimation techniques. These empirical findings suggest that, to the extent shocks are country – specific, a common monetary policy might have asymmetric effects in an euro area extended early to the new EU members. This policy implication needs however two qualifications: the cost of adopting a common monetary policy depends first, on the extent to which the exchange rate can be used as an efficient shock absorber and second, on the extent to which monetary policy can be used effectively to stabilizing economic activity. Furthermore, the relationship between similarity of economic structures, bilateral trade intensity, on the one hand, and, business cycles synchronization, on the other hand, is found endogenous suggesting that, in the long term, convergence of economic structures and trade growth are expected. If the adoption of the euro will be well prepared it will bring significant benefits to the new EU countries.

Key Words: Economic and Monetary Integration, Optimum Currency Area,
Business Cycles, Sectoral Specialization

JEL Classification: E32, F15, F33, F41

Acknowledgements

This paper was prepared as part of the DG ECFIN Visiting Fellows Programme 2004. I have benefited from stimulating discussions with DG ECFIN staff during my visit on 15-19 March 2004. I am in particular grateful to Jürgen Kröger, Servaas Deroose, Karl Pichelmann, Lars Jonung, Peter Weiss, Johan Baras, Filip Keereman, Frank Schönborn, Douglas Kozerek, Martin Hallet, Michael Stierle, Christian Gayer, and Peer Ritter. Cecilia Mulligan and Jeannete Bell provided excellent logistic support and assistance. I thank Jürgen von Hagen, Michael Artis, Michael Massmann, Christian Volpe Martincus, Chris Graham, Larry Schembri and participants at research seminars at the Center for European Integration Studies, University of Bonn, INFER Working Group on Business Cycles and Growth, DG ECFIN at the European Commission and at the 2004 Annual Conference of the Canadian Economics Association for helpful comments and suggestions.

Contents

1	Introduction	5
2	Theoretical Framework	7
3	Empirical Evidence and Stylized Facts	8
4	Model Specifications and Estimation Issues	9
5	Measurement and Data	13
6	Descriptive Analysis	14
7	Empirical Results	17
8	Conclusion	19
	References	20
	Appendix	34

1 Introduction

Ten countries¹ joined the European Union (EU) on 1st May 2004. None of these countries has been allowed to opt-out from the Economic and Monetary Union (EMU). This implies that they are expected to adopt the euro at a time sooner or later after their EU accession. The strategies for the adoption of the euro vary across these countries. Some of them have recently made an explicit reference² to the time they target for the adoption of the euro. This is announced as early as 2007 (Cyprus and Slovenia) while others have indicated 2008 (Latvia), 2008– 2009 (Slovakia) or 2009-2010 (the Czech Republic, Hungary) as the time they would be ready to adopt the euro. Some countries have made a less explicit reference to the time for the adoption of the euro: as soon as possible (Estonia), as soon as the convergence criteria are fulfilled (Malta) or they made no explicit reference to the time for the adoption of the euro (Lithuania and Poland). When should the new EU members adopt the euro?

The objective of this paper is to inform the ongoing debate about the extension of the euro area to the new EU members. In particular, I provide empirical evidence about the synchronization of business cycles between the Central European new EU member states (CE-EU-8) and euro area members over the period 1990-2003. This evidence is relevant for the assessment of the cost of losing monetary policy as a tool to stabilizing cyclical fluctuations and thus for the assessment of the effects of extending a common monetary policy to the new EU countries.

Using data for the period 1990-2003 I find that, over the analyzed period, structural and cyclical differences between EU acceding countries and euro area members were significant. On average, other things equal, the more dissimilar economic structures were, the less correlated the business cycles were. On average, other things equal, the higher the bilateral trade intensity, the more correlated the business cycles.

The accession of the ten countries to the EU on 1st May 2004 has stimulated a growing academic and policy debate about when should the euro area be extended to the new EU members. This discussion takes two main avenues. The first line of discussion focuses on the nominal convergence, specifically the fulfillment of the Maastricht convergence criteria: high degree of price stability; sound fiscal situation - with respect to the budget deficit and the level of government debt; stable exchange rates; convergence of long-term interest rates. According to the latest available data (European Commission, 2004), in 2003 only Estonia and Lithuania fulfilled the convergence criteria with respect to price stability, budget deficit, government debt and interest rates. The stability of exchange rates is to be proved within the Exchange Rate

¹ Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia

² these references are made in the Convergence Programmes for 2004-2007 submitted by each of these ten countries in May 2004

Mechanism (ERM II). This challenge is significant in particular for countries with flexible exchange rates and less for the Baltic countries which have already fixed exchange rates³.

The second line of the debate about the euro area enlargement is related to real convergence and has centered on assessing the costs and benefits of a common currency area. This discussion has been inspired largely by the Optimal Currency Area (OCA) literature flowing from Mundell (1961), Mc Kinnon (1963), Kenen (1969). The benefits from a common currency are related to the reduction of transaction costs and predictability of exchange rates. High levels of integration are associated with larger benefits for the participating countries. The costs of joining a common currency area relate to losing monetary policy as a stabilizing tool following external shocks. To the extent that participating countries are faced with common aggregate shocks the costs of losing independence of monetary policy is not important. Common shocks imply the co-movement of economic activity cycles which in turn is more likely if economic structures are similar.

The OCA literature suggests a number of policy relevant questions in relation to the euro area enlargement to the new EU members : How synchronized are business cycles between the new EU member states and the current euro area members? To what extent does the similarity of sectoral structures contribute to business cycles synchronization? Does more integration lead to more synchronization of economic activity?

This paper contributes to the discussion about benefits and costs associated with the extension of the euro area to the new EU countries. In particular, I investigate the effects of the similarity of economic structures and bilateral trade intensity between the current euro area members and the CE-EU-8 on the correlation of business cycles across countries. The contribution of this paper to the literature is threefold. *First*, it brings novel evidence about the degree of synchronization of business cycles between the current euro area members and the new EU member states. *Second*, this paper uncovers patterns of sectoral specialization and bilateral trade intensity in the current and new EU countries. *Third*, it assesses to what extent correlations of business cycles are explained by the similarity of economic structures and bilateral trade intensity.

The remainder of this paper is organized as follows. Section 2 discusses the theoretical framework used for the empirical analysis of business cycles synchronization. I next summarize related existing empirical evidence and stylized facts. Model specifications and estimation issues are discussed in section 4. Section 5 presents measures and data used for the empirical analysis. Summary statistics and a descriptive analysis of correlations of business cycles, bilateral sectoral specialization and trade intensity are discussed in Section 6. Section 7 presents the results of the econometric analysis and section 8 concludes.

³ Estonia, Lithuania, and Slovenia have joined the ERM II on 27 June 2004.

2 Theoretical Framework

The theoretical framework for investigating benefits and costs of monetary unions is the Optimum Currency Area Theory (OCA) developed during the 1960s by the seminal contributions of Mundell (1961), McKinnon (1963) and Kenen (1969). The main outcome of the OCA literature⁴ is the identification of the properties of an optimum currency area, including the mobility of labour, price and wage flexibility, economic openness, diversified production and consumption structures, similarity of inflation rates, fiscal integration and political integration. Later contributions during the 1970s (Corden 1972, Mundell, 1973, Ishihama, 1975, Tower and Willet, 1976) added to these properties similarity of cycles and shocks and correlation of incomes. If these properties were shared by the countries willing to form a currency union, the cost of losing the nominal exchange rate and monetary policy to adjust to idiosyncratic shocks would not be prohibitive.

A demand shock to one country's exports can be accommodated through a devaluation of the currency, a fall in real prices and wages or an increase in unemployment. Given the rigidity of prices and wages and the political and economic cost of rising unemployment, the exchange rate mechanism could be an important policy tool to maintain. On the other hand, countries with similar characteristics are more likely to respond similarly to external shocks and so they will need less an adjustment through exchange rates.

A number of examples from recent experiences of EU-15 member states suggest that nominal exchange rate adjustment was effective. The case of the 1982 devaluation in Belgium is documented by De Grauwe (2003), the French devaluation of 1982-1983 by Sachs and Wyplosz (1986) while Mongelli (2002) points out that the devaluation of the Italian Lira after the exit from the ERM in 1992 contributed to a sustained recovery of economic activity. The effectiveness of nominal exchange rates for adjustment to external shocks is however contested by others (see Krugman, 1991, 1993; Canzoneri, Valles and Vinals, 1996).

The cost from foregoing monetary independence is low for countries with significant co-movements of outputs and prices (Alesina, Barro and Tenreyro, 2002). The more correlated the business cycles are the more likely it is that country-specific shocks become correlated through an internationally correlated business cycle. In contrast, countries whose business cycles are imperfectly synchronized with other's could benefit from maintaining an independent monetary policy (Frankel and Rose, 1998).

Does deeper integration lead to more correlated business cycles? Two different views can be distinguished in the recent literature. On the one hand, Krugman (1993) argues that increased integration will result in increased specialization and this, in turn, to less synchronized business cycles. This view is supported by Kalemli-Ozcan, Sorensen and Yosha (2001) who show that

⁴ For a recent survey of the OCA literature see Mongelli (2002)

increased capital market integration leads to better income insurance and increased specialization. On the other hand, Coe and Helpman (1995) and Frankel and Rose (1998) argue that trade integration is associated with more synchronized business cycles.

In summary, existing theories yield ambiguous predictions about the role of monetary and economic integration on business cycles correlations. The question of whether and to what extent sectoral specialization and bilateral trade intensity contribute to business cycles synchronization is an empirical one.

3 Empirical Evidence and Stylized Facts

Compared to the theoretical developments, empirical evidence of the OCA theory is more recent and is mostly related to the European Economic and Monetary Union. Two directions in the OCA empirical literature can be distinguished. The first one is inspired by recent developments in trade theory and economic geography and points to increasing specialization associated with monetary integration and thus increased vulnerability to asymmetric supply shocks (Krugman, 1993). The second line of research argues that trade integration and correlation of business cycles are endogenous (Coe and Helpman, 1995; Frankel and Rose, 1998).

Two main stylized facts come out from the empirical literature. The first stylized fact is that higher economic integration proxied with bilateral trade intensity is associated with higher correlations of business cycles (Clark and van Wincoop, 2001; Rose and Engel, 2002; Bergman, 2003; Calderon, Chong and Stein, 2003;). Second, similar economic structures are associated with higher correlations of business cycles (Clark and van Wincoop, 2001; Calderon, Chong and Stein, 2003). These studies are focused on industrial and developing countries. There is, however, no study investigating the international transmission of business cycles in the context of increased economic integration between the EU and Central and Eastern European countries (CEECs).

A number of studies estimate the degree of synchronization of business cycles between the EU and the CEECs. Boone, Maurel (1999) argue that economic cycles in CEECs are close enough to Germany and, albeit to a lesser extent, to the EU and suggest that this implies benefits for these countries once they join the euro area. They find that the percentage of business cycles fluctuations in CEECs explained by a German shock is high. Between 55 and 86 per cent of the fluctuation of the unemployment in CEECs is explained by a German shock. Babetsky, Boone, Maurel (2002) support this conclusion. Fidrmuc (2001) predicts that given the high level of intra-industry trade of CEECs vis-à-vis the EU, business cycles of CEECs and EU are likely to harmonize in the future assuming that membership in the euro area will further increase the intra – industry trade levels in CEECs.

However, a number of more recent studies highlight the rather different macroeconomic developments in the current EU and CEECs.

Artis et al (2003) analyse the synchronization of business cycles in the eight Central European acceding countries using GDP and industrial production data over the period 1990-2002. They uncover the business cycles using a band-pass filter based on two low-pass Hodrick-Prescott filters and applying dating rules described in Artis et al (2002) and calculate cross-correlations and measures of concordance. They find a low degree of concordance within the group of the acceding countries in comparison to that existing between the existing EU countries. The GDP data indicate a low synchronization of business cycles between the acceding countries and the Eurozone. However, the cyclical synchronization between Poland, Slovenia, Estonia, Hungary, the Czech Republic and Germany is found large. On the other hand, in comparison to countries taking part in previous enlargements (Ireland, UK, Greece, Spain, Portugal, Austria, Finland, Sweden), the acceding countries are less synchronized with Germany, France and Italy with the exception of Hungary, Poland and Slovenia.

Süppel (2003) assesses the degree of business cycles synchronization of individual EU acceding countries with the euro area aggregate and highlights the structural differences in economic growth dynamics between the EU-15 and the CEECs. Using data for 1996-2002, he finds that the CEECs had higher average growth and wider output fluctuations than the euro area and other EU countries. Furthermore, business cycles in the CEECs have been less synchronized with the euro area than those of the United Kingdom, Sweden and Denmark. Business cycle synchrony is country specific, with Hungary, Poland and Slovenia moving closer to the euro area and the Czech Republic and Slovakia showing important asymmetries with the euro area.

Darvas and Szapary (2003) find also that Hungary, Poland and Slovenia have the most synchronized macroeconomic activity with the euro area.

The above results on asymmetries of business cycles between the EU and accession countries are supported by a recent analysis presented in the EBRD (2003).

4 Model Specifications and Estimation Issues

The objective of this analysis is to uncover *first*, the extent to which business cycles are synchronized between the CE-EU-8 and the current euro area members and, *second*, the impact of sectoral specialization and bilateral trade intensity as explanatory factors of the correlations of business cycles across these countries.

The dependent variable in the estimated models is the bilateral correlation of the cyclical components extracted from quarterly real GDP over the analyzed period. The key explanatory

variables are an index of bilateral sectoral specialization and an index of bilateral trade intensity. Bilateral sectoral specialization is calculated as average using quarterly gross value added disaggregated on six sectors. Bilateral trade intensity is calculated as average over the analyzed period using bilateral trade flows.

Business cycles synchronization for different country-pairs

To what extent are business cycles in the CE-EU-8 correlated with those of the euro area members? In order to answer this question, I estimate the following model in which the correlation of business cycles between CE-EU-8 countries and euro area countries is taken as benchmark:

$$(1) \quad CORR(Y_i^c, Y_j^c)_T = \alpha_0 + \alpha_1 EURO_{ij} + \alpha_2 AC_{ij} + \omega(i, j)_t$$

$CORR(Y_i^c, Y_j^c)_T$: the bilateral correlation of the cyclical components of output Y (real GDP) in countries i and j over the period T.

$EURO_{ij} = 1$, if countries i and j are euro area members; $EURO_{ij} = 0$, for the other country - pairs (pairs of euro area members and the CE-EU-8 countries, pairs of CE-EU-8 countries);

$AC_{ij} = 1$, if country i and j are CE-EU-8 countries and $AC_{ij} = 0$, for the other remaining country-pairs

$\omega(i, j)_T$: the remaining error term

Given the extent of economic and monetary integration, I expect to find that business cycles between the euro area countries are more synchronized than those between the CE-EU-8 countries and the euro area countries. The predicted result for the correlations of business cycles between the CE-EU-8 countries is less clear.

The impact of bilateral sectoral specialization

The OCA literature points to similarity of economic structures as a factor fostering business cycles synchronization. What is the role of sectoral specialization in explaining correlations of business cycles? I investigate this question by estimating the following model with OLS:

$$(2) \quad CORR(Y_i^c, Y_j^c)_T = \beta_0 + \beta_1 \ln(SPEC_{ij})_T + \varepsilon(i, j)_T$$

$\ln(SPEC_{ij})_T$: index of similarity of economic structures between countries i and j over the period T

$\varepsilon(i, j)_T$: the error term

In the above model, sectoral specialization is assumed exogenous. However monetary integration may lead to the convergence of economic structures of the participating countries. This implies that the estimates obtained with OLS might be inconsistent. If this is true, an instrumental variable (IV) estimation technique must be used. In order to test for endogeneity, I estimate the following system of simultaneous equations (3) and perform the Durbin-Wu-Hausman test suggested by Davidson and MacKinnon (1993)⁵:

$$CORR(Y_i^c, Y_j^c)_T = \beta_0 + \beta_1 \ln(SPEC_{ij})_T + \varepsilon(i, j)_T$$

$$\ln(SPEC_{ij})_T = \delta_0 + \delta_1 EURO_{ij} + \delta_2 \ln(POP_i * POP_j)_T + \delta_3 (\ln GDP_i * GDP_j)_{1996} + \delta_4 \ln DIST_{ij} + \delta_5 BORDER_{ij} + \xi(i, j)_T$$

Countries members of the euro area have more similar economic structures as a result of economic and monetary integration. I control for this by including a dummy variable $EURO_{ij}$ which takes value 1 if countries i and j are members of the euro area. Sectoral specialization is expected to depend on the size of the country. Larger countries are more likely to have more diversified economic structures in comparison to small countries. The variables used to control for size are population and real GDP. The variables are transformed in natural logarithms (the natural logarithm of the product of the population size of country i and country j calculated as average over the period T : $\ln(POP_i * POP_j)_T$; and the natural logarithm of the product of the real GDP in country i and country j in the reference year 1996: $\ln(GDP_i * GDP_j)_{1996}$.

The closer geographically the countries are the more similar economic structures might be. The natural logarithm of the distance between the capitals of pairs of countries ($\ln DIST_{ij}$) and a dummy for countries sharing borders ($BORDER_{ij}$) are included as additional explanatory variables.

The impact of bilateral trade intensity

In the recent literature it is argued that increased trade relations lead to increased correlations of business cycles. To uncover whether and the extent to which bilateral trade increases the

⁵ This test is based on including the residuals of each endogenous explanatory variables, as a function of all exogenous variables, in the regression of the original model.

correlation of business cycles between the acceding countries and the EURO AREA members I estimate the following model with OLS:

$$(4) \quad CORR(Y_i^c, Y_j^c) = \phi_0 + \phi_1 \ln(TRADE_{ij})_T + \nu(i, j)_T$$

$\ln(TRADE_{ij})_T$: bilateral trade intensity between country i and country j over the period T

However, bilateral trade intensity and business cycles correlations are likely to be endogenous in the context of monetary integration. I therefore test and correct for the endogeneity of the bilateral trade intensity using the following system of simultaneous equations (5):

$$CORR(Y_i^c, Y_j^c) = \phi_0 + \phi_1 \ln(TRADE_{ij})_T + \nu(i, j)_T$$

$$\ln(TRADE_{ij})_T = \gamma_0 + \gamma_1 EURO_{ij} + \gamma_2 \ln(POP_i * POP_j)_T + \gamma_3 \ln(GDP_i * GDP_j)_{1996} + \gamma_4 \ln DIST_{ij} + \gamma_5 BORD_{ij} + \mu(i, j)_T$$

Similar to the case of sectoral specialization, I perform the Durbin-Wu-Hausman test and if this uncovers endogeneity I estimate Eq.4 using instrumental variables as shown above.

The impact of sectoral specialization and bilateral trade intensity

In the last set of model specifications I include both bilateral sectoral specialization and trade intensity as explanatory variables as shown in Eq. (5) below:

$$CORR(Y_i^c, Y_j^c) = \lambda_0 + \lambda_1 \ln(SPEC_{ij})_T + \lambda_2 \ln(TRADE_{ij})_T + \tau(i, j)_T$$

Further, I check for endogeneity, performing the Durbin-Wu-Hausman test as in the previous model estimations. The system of simultaneous equations (6) is the following:

$$CORR(Y_i^c, Y_j^c) = \lambda_0 + \lambda_1 \ln(SPEC_{ij})_T + \lambda_2 \ln(TRADE_{ij})_T + \tau(i, j)_T$$

$$\ln SPEC_{ij} = \delta_0 + \delta_1 EURO_{ij} + \delta_2 \ln(POP_i * POP_j)_T + \delta_3 (\ln GDP_i * GDP_j)_{1996} + \delta_4 \ln DIST_{ij} + \delta_5 BORDER_{ij} + \xi(i, j)_T$$

$$\ln(TRADE_{ij})_T = \gamma_0 + \gamma_1 EURO_{ij} + \gamma_2 \ln(POP_i * POP_j)_T + \gamma_3 \ln(GDP_i * GDP_j)_{1996} + \gamma_4 \ln DIST_{ij} + \gamma_5 BORD_{ij} + \mu(i, j)_T$$

5 Measurement and Data

The key variables used in this analysis are bilateral correlations of business cycles, sectoral specialization and trade intensity. This section explains the measuring of these three variables and the data set used for the empirical analysis.

Bilateral correlation of business cycles

Correlations of business cycles are calculated over the period T. I first extract for each country the cyclical component of real GDP using the Baxter – King filter⁶ described in Baxter and King (1999). The filtering procedure uses the classical definition of a business cycle given by Burns and Mitchell (1946). It therefore isolates real GDP fluctuations lasting between 6 and 32 quarters (1.5 and 8 years). This detrending technique removes both the low frequency long-term trend growth and the high frequency irregular components and retains intermediate components, “business cycles”.

Bilateral sectoral specialization

The similarity of economic structures between countries i and j is proxied with the following index used by Krugman (1991):

$$SPEC_{ij} = \sum_{k=1}^n |s_{ki} - s_{kj}|$$

s_{ki} : the share of sector k in total GDP in country i

The index takes values between 0 (perfect similarity) and 2 (maximum dissimilarity). The higher the index the less similar the economic structures of the two countries i and j are.

The index of bilateral sectoral specialization is calculated here on the basis of average sectoral shares over the period T.

Bilateral trade intensity

The bilateral trade intensity over the period T is proxied with the following index:

$$(TRADE_{ij})_T = \frac{1}{T} \left(\sum_{t=1}^T \frac{X_{ijt} + M_{ijt}}{F_{it} + F_{jt}} \right)$$

X_{ijt} : exports of country i to country j in year t

M_{ij} : imports of country i from country j in year t

⁶ Baxter and King (1999) find that the cyclical component of US GNP obtained with this band-pass filter is superior to those obtained with other detrending methods

F_{it} : total trade flows of country i in year t

The data set

In this paper I use data for 10 euro area countries⁷ and 8 Central European new EU countries⁸ over the period 1990-2003. There are in total 153 country pairs, of which 80 represent pairs of euro area countries and CE-EU-8 countries, 45 country pairs between euro area members, and the remaining 28 country pairs are among the CE-EU-8 countries.

The correlations of business cycles are calculated using quarterly data for real GDP over the period 1990:1-2003:3. The bilateral specialization index is calculated using quarterly sectoral gross value added data for the same period, 1990:1-2003. For the cases of Portugal and Greece quarterly data was not available. For these two countries the specialization index was calculated using annual sectoral gross value added data for the period 1995-2000. Bilateral trade intensity is calculated using annual bilateral trade flows (exports f.o.b, imports c.i.f.) for the period 1990-2001 from the International Monetary Fund⁹.

In addition to the data mentioned above used for measuring the three key variables, the following data are used for the instrumental variables included in the model specifications described in the previous section: annual averages for population over the period 1990-2002, real GDP in a reference year (1996) and bilateral distances between capital cities. Bilateral distances between capitals of country pairs is proxied with the fastest connection in km on road¹⁰.

Detailed country-specific data information and sources are given in the Appendix.

6 Descriptive Analysis

Correlations of business cycles

Summary statistics of correlations of business cycles for the different country pairs are shown in Table 1.

Table 1 here

The average of the business cycles correlations for all country pairs is low, 0. 201. The average of business cycles correlations is the highest for the euro area country pairs (0.596) and the lowest for the CE-EU-8 country pairs (0.112). The average correlation of business cycles

⁷ Belgium, Germany, Greece, Spain, France, Italy, the Netherlands, Austria, Portugal, Finland. Ireland and Luxembourg could not be included due to data limitations.

⁸ The Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Slovenia, Slovakia

⁹ IMF DOT Database

¹⁰ data was taken from Straßen & Reisen 2003/2004, and www.reiseplanung.de

between the euro area and CE-EU-8 countries is less than half that for the euro area countries (0.279) but more than double the average correlation for the CE-EU-8 countries. The variation of the business cycles correlations is the lowest for the euro area countries and the highest for the country pairs between euro area and the CE-EU-8 countries.

What country-specific characteristics of correlations of business cycles can be identified? Chart 1 shows average weighted correlations for each country with the euro area plotted against the weighted average correlations with the CE-EU-8 countries over the analyzed period.

Chart 1 here

Average correlations with the euro area countries are higher compared with average correlations with the CE-EU-8 countries. Correlations between euro area countries are higher compared with the correlations with the CE-EU-8 countries. Correlations between the CE-EU-8 countries are lower. Among the euro area countries, Belgium, Austria and the Netherlands have the highest average correlations with the euro area countries (0.558, 0.545, 0.502) and Portugal, Greece and Germany the lowest (0.280, 0.332, 0.310). The Netherlands, Germany, Belgium and Austria have the highest correlations with the acceding countries (0.064, 0.063, 0.061, 0.060) while Greece, France and Italy the lowest (-0.001, 0.038, 0.040). Among the acceding countries Poland, Slovenia and Hungary are the closest correlated with the euro area countries (0.402, 0.320, 0.178) while Lithuania, Slovakia and the Czech Republic are the least correlated (-0.293, -0.260, -0.093). Hungary, Slovenia and Estonia are the closest correlated with the CE-EU-8 countries (0.036, 0.032, 0.031) and the Czech Republic, Lithuania and Poland the least (-0.037, -0.019, -0.009).

Bilateral sectoral specialization

Table 2 shows summary statistics for bilateral sectoral specialization. The lower the index of sectoral specialization between two countries the more similar the economic structures are for those countries.

Table 2 here

The euro area countries are more similar compared to the sectoral specialization between the euro area and CE-EU-8 countries. The variation of sectoral specialization is the lowest for the euro area countries and the highest for the country pairs including euro area and CE-EU-8 countries.

Table 3 showing the sectoral shares differentials for the euro area and CE-EU-8 countries reinforces the summary statistics discussed above. Sectoral shares are calculated as shares of

sectoral gross value added in total GDP averaged over the period 1990:1-2003 using quarterly gross value added data.

Table 3 here

In comparison to the euro area countries, the CE-EU-8 countries have higher shares of agriculture, industry and commercial, trade, transport and communication services, while the shares of financial and public services are lower. The share of construction is only slightly higher in the acceding countries in comparison to the euro area countries. Table 3 indicates that an enlarged euro area, agriculture and industry will have higher shares in total GDP while financial, real estate and business services and public services will have lower shares.

Chart 2 shows country-specific average bilateral sectoral specialization indices¹¹ with the euro area and the CE-EU-8 countries.

Chart 2 here

The chart shows that euro area countries have quite similar economic structures while the economic structures of the acceding countries are more dissimilar both with respect to the euro area and the CE-EU-8 countries. Hungary, Slovenia, Estonia and Slovakia have the closest economic structures to the euro area. The most similar to the CE-EU-8 countries in the euro area group are Spain, Finland, Portugal, Austria, and Italy.

Bilateral trade intensity

Table 4 shows summary statistics for bilateral trade intensity.

Table 4 here

Average bilateral trade intensities are higher for country pairs between the euro area members compared to country pairs including the CE-EU-8. Bilateral trade intensity is the highest between the euro area countries and the lowest between the CE-EU-8 countries and euro area members. The variation of bilateral trade intensity is however the highest for the euro area country-pairs and the lowest for the CE-EU-8 – euro area country pairs.

Chart 3 shows country-specific average bilateral trade intensity¹² with the euro area countries and the CE-EU-8 countries.

Chart 3 here

The initial EU founders (France, Germany, Belgium, Italy, the Netherlands) and Spain have the highest bilateral trade intensity with the euro area. In comparison to this group of countries,

¹¹ Weighted averages calculated using population weights

¹² Average bilateral trade intensities are weighted averages calculated using population weights

Austria, Portugal and Greece have lower bilateral intensities with the euro area. Germany and Austria have higher bilateral trade intensities with the CE-EU-8 countries compared with the other euro area countries. Bilateral trade intensities of CE-EU-8 countries with the euro area countries are relatively low. With respect to the CE-EU-8 countries, bilateral trade intensities of these countries are also low except Slovakia and the Czech Republic.

7 Empirical Results

How synchronized are business cycles between the CE-EU-8 countries and the current euro area members? Table 5 shows the results of the OLS estimation of Eq. 1. The first column shows the estimation results obtained using all country-pairs. As a robustness check, I estimate the same model excluding in three steps the following countries: Greece and Portugal; Germany; Poland.

Table 5 here

The estimated coefficients indicate whether and to what extent bilateral correlations of business cycles between the CE-EU-8 countries and euro area members differ when compared to the bilateral business cycles correlations between euro area countries and between the CE-EU-8 countries, respectively. The bilateral correlations of business cycles between euro area countries are significantly higher compared to the reference country-pairs group. When Greece and Portugal are excluded, the coefficient for the bilateral correlations of business cycles between the euro area countries is higher in comparison to the coefficient obtained with all country pairs suggesting that these two countries are less correlated with the CE-EU-8. Estimated coefficients for the bilateral correlations between euro area countries with respect to the reference country-pairs are also obtained when Germany and Poland are excluded. The bilateral correlations of business cycles between the CE-EU-8 countries are not significantly different from the bilateral correlations of business cycles between euro area and the CE-EU-8 countries except the case when Poland is excluded. In this later case, the bilateral correlations of business cycles between the CE-EU-8 countries appear significantly higher in comparison to the bilateral correlations for the reference group.

The next set of regressions uncover the impact of bilateral sectoral specialization and trade intensity on bilateral correlations of business cycles. I estimate the models described in section 4 for all country pairs (results are shown in Table 6) and as a robustness check excluding Greece and Portugal (see Table 8), Germany (see Table 10) and Poland (see Table 12) using first OLS and, after checking for endogeneity, an instrumental variables procedure (see Tables 7, 9, 11 and 13 for the estimations using instrumental variables).

Tables 6-13 here

The results are consistent to different groups of country-pairs and different estimation techniques and indicate that similarity of economic structures and higher bilateral trade intensity are associated with higher correlations of business cycles.

Columns 1 in the above tables show the results of the OLS estimations testing the impact of sectoral specialization on bilateral correlations of business cycles. The negative and significant estimated coefficients for the specialization index indicate that similarity of economic structures is associated with higher correlations of business cycles. As discussed above, sectoral specialization and business cycles correlations might be endogenous in the context of economic and monetary integration. The result of the endogeneity test indicate that this is indeed the case. I then re-estimate the model (1) using instrumental variables for the bilateral specialization index. The results of the estimations using instrumental variables are shown in Columns (2). The estimated coefficients for bilateral sectoral specialization are negative and significant and even higher.

Columns 3 in the above tables show the coefficients for the bilateral trade intensity estimated with OLS and indicate that the bilateral trade intensity is positively and significantly associated with the correlations of business cycles. As suggested by Frankel and Rose (1998) bilateral trade intensity and bilateral correlations of business cycles might be endogenous. The endogeneity test indicates that this is indeed the case with the exception of the country pairs group excluding Greece and Portugal. The estimated coefficients of bilateral trade intensity using instrumental variables shown in columns (4) support the conclusion that the higher the bilateral trade intensity is the higher the bilateral correlations of business cycles.

The last set of regressions tests for the impact of bilateral sectoral specialization and trade intensity included in the same model. The OLS estimations shown in columns (5) of the above tables are in line with the previous results and indicate that similarity of economic structures and bilateral trade intensity are positively and significantly associated with bilateral correlations of business cycles. The estimated coefficient for sectoral specialization decreases when Germany is excluded. The performed Durbin-Wu-Hausman test indicates that the explanatory variables and the dependent variable are endogenous. I therefore re-estimate the model using instrumental variables for bilateral sectoral specialization and bilateral trade intensity. The estimated coefficients in the model using instrumental variables are shown in columns (6) and indicate that similarity of economic structures and bilateral trade intensity are positively and significantly associated with bilateral correlations of business cycles. However, when Germany is excluded the coefficient for bilateral sectoral specialization is no longer significant.

8 Conclusion

Countries wishing to join monetary unions should weight the benefits of lower transaction costs and elimination of exchange rates volatility between the participants and the costs of losing monetary policy as a stabilizing tool. On the one hand, the higher the degree of economic integration, the higher the benefits of joining a common currency area are. On the other hand, the more similar the countries are, the more similar their response to external shocks are, and thus the lower the cost of foregoing an independent monetary policy.

In this paper I investigated the bilateral correlations of business cycles between the CE-EU-8 countries and the current euro area members over the period 1990-2003. I find that asymmetries of business cycles between the CE-EU-8 and the euro area members are significant. Among these countries, average correlations of business cycles with the euro area are the highest in the cases of Poland, Slovenia, and Hungary. This result is similar to the findings of Artis et al (2003), Darvas and Szapary (2003) and Süppel (2003). In comparison with the current euro area countries, the CE-EU-8 countries have lower bilateral trade intensities and less similar economic structures. The results of the empirical analysis in this paper indicate that similar economic structures and bilateral trade intensity are positively and significantly associated with the bilateral correlations of business cycles, in line with previous studies on industrial countries (Clark and van Wincoop, 2001; Rose and Engel, 2002), and developing countries (Calderon, Chong and Stein, 2003).

This paper provides empirical evidence suggesting that an immediate extension of a common monetary policy to the new EU countries might have asymmetric effects. This policy implication needs however two qualifications: the cost of adopting a common monetary policy depends first, on the extent to which the exchange rate can be used as an efficient shock absorber and second, on the extent to which monetary policy can be used effectively to stabilizing economic activity. The relationships between similarity of economic structures, bilateral trade intensity, on the one hand, and, business cycles synchronization, on the other hand, are found endogenous suggesting that, in the long term convergence of economic structures and trade growth are expected. If the adoption of the euro will be well prepared it will bring significant benefits to the new EU countries.

References

- Artis, M., M. Marcellino, T. Proietti (2002) "Dating the Euro area Business Cycle, *CEPR Discussion Paper* No 3696 and *EUI Working Paper*, ECO 2002/24
- Artis, M., M. Marcellino, T. Proietti (2003) "Characterising the Business Cycle for the Accession Countries", European Forecasting Network, Autumn 2003 Report, http://www.efn.uni-bocconi.it/Annex_to_chapter_4.pdf
- Alesina, A., R. Barro, and S. Tenreyro (2002) "Optimal Currency Area", NBER Working Paper No. 9702
- Babetsky, J., L. Boone, and M. Maurel (2002) "Exchange Rates Regimes and Supply Shocks Asymmetry: The Case of the Accession Countries", CEPR Discussion Paper No. 3408, London: Center for Economic Policy Research
- Baxter, M. and R. G. King (1999) "Measuring Business Cycles: Approximate Band- Pass Filters for Economic Time Series", *Review of Economics and Statistics*, 81, 575-593
- Bergman, M. (2003) "How Synchronized are European Business Cycles?", paper presented at the 4th EUROSTAT and DG ECFIN Colloquium on "Modern Tools for Business Cycle Analysis: Growth and Cycle in the Euro-Zone"
- Boone, L., and M. Maurel (1999) "An Optimal Currency area Perspective of the EU Enlargement to the CEECs", CEPR Discussion Paper No. 2119, London: Center for Economic Policy Research
- Burns, A. M., and W. C. Mitchell (1946) *Measuring Business Cycles*, New York: National Bureau of Economic Research
- Calderon, C., A. Chong, E. Stein (2003) "Trade Intensity and Business Cycle Synchronization: Are Developing Countries Any Different?", IADB Working Paper No. 478, Washington D.C.: Inter-American Development Bank
- Canzoneri, M., J. Vallés and J. Vinals (1996) "Do Exchange Rate Move to Address International Macroeconomic Imbalances?", CEPR Discussion Paper no. 1498, London: Center for Economic Policy Research
- Clark, T.E., E. van Wincoop (2001) "Borders and Business Cycles", *Journal of International Economics*, 55, 59-85
- Coe, D. T., and E. Helpman (1995) "International R & D Spillovers", *European Economic Review*, 39, 859-887
- Corden, W. M. (1972) "Monetary Integration. Essays in International Finance", Princeton University

- Darvas and Szapary (2003) "Business Cycles Synchronisation in the Enlarged EU: Comovements in the New and Old Members", paper presented to the 2004 ASSA Congress, San Diego
- Davidson, R. and J. G. MacKinnon (1993) *Estimation and Inference in Econometrics*, New York: Oxford University Press
- De Grauwe, P. (2003) *Economics of Monetary Union*, Fifth Edition, Oxford: Oxford University Press
- European Bank for Reconstruction and Development (EBRD) (2003) *Transition report 2003: Integration and regional cooperation*, London: European Bank for Reconstruction and Development
- European Commission (2004) "Spring 2004 Economic Forecasts", *European Economy* No. 2, Luxembourg: Office for Official Publications of the EC
- Frankel, F. and A. Rose (1998) "The Endogeneity of the Optimum Currency Area Criteria", *The Economic Journal*, 108, 1009-1025
- Fidrmuc (2001) "The Endogeneity of Optimum Currency area Criteria, Intra-Industry Trade and EURO AREA Enlargement", Bank of Finland, Discussion Paper No. 8, Helsinki
- Ishihama, (1975) "The Theory of Optimum Currency Areas: A Survey", IMF Staff Papers, 22, 344-383, Washington D.C.: International Monetary Fund
- Kalemli-Ozcan, Sørensen and Yosha (2001) "Economic Integration, Industrial Specialization, and the Asymmetry of Macroeconomic Fluctuations", *Journal of International Economics*
- Kenen, P. (1969) "The Theory of optimum Currency Areas: An Eclectic View", in Mundell, R. and A. K. Swoboda (eds.) *Monetary Problems of the International Economy*, University of Chicago Press, 41-60
- Krugman, P. (1991) *Geography and Trade*, Cambridge: MIT Press
- Krugman, P. (1993) "Lessons of Massachusetts or EURO AREA", in T. Giavazzi, and F. Torres, (eds.), *Adjustment and Growth in the Economic and Monetary Union in Europe*, New York: Cambridge University Press, 241-261
- McKinnon, R. (1963) "Optimum Currency Areas", *American Economic Review*, vol. 52, 717-725
- Mongelli, F. P. (2002) "New Views on the Optimum Currency Area Theory: What is EURO AREA Telling Us?", ECB Working Paper No. 138, Frankfurt: European Central Bank
- Mundell, R. (1961) "A Theory of Optimum Currency Area", *American Economic Review*, vol. 51, 657-665

- Rose, A. and C. Engel (2002) "Currency Unions and International Integration", *Journal of money, Credit and Banking*, vol 34 (4), 1067- 1087
- Sachs, J. and C. Wyplosz (1986) "The Economic Consequences of President Mitterand", *Economic Policy*, 2
- Süppel, R. (2003) "Comparing Economic Dynamics in the EU and CEE Accession Countries", ECB Working Paper No. 267, Frankfurt: European Central Bank
- Tower, E. and T. Willet (1976) "The Theory of Optimum Currency Areas and Exchange Rate Flexibility", Princeton University

Table 1: Summary Statistics for Business Cycles Correlations between the euro area and CE-EU-8 countries, 1990:1-2003:3

Country pairs	Observations	Mean	Standard deviation	Min	Max
All pairs	153	0.2010	0.4078	-0.7225	0.9251
EURO_AC	80	0.2787	0.4067	-0.5521	0.9251
EURO	45	0.5960	0.2043	0.0987	0.9251
AC	28	0.1121	0.3816	-0.7225	0.9073

Source: Own calculations based on EUROSTAT data

EURO: Belgium, Germany, Greece, Spain, France, Italy, The Netherlands, Austria, Portugal, Finland

AC: the Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Slovenia, Slovakia

Table 2 : Summary Statistics for Sectoral Specialization between the euro area and CE-EU-8 countries, 1990:1-2003:3

Country pairs	Observations	Mean	Standard deviation	Min	Max
All pairs	153	0.2450	0.1081	0.0660	0.5236
EURO_AC	80	0.2628	0.1264	0.0635	0.5236
EURO	45	0.1687	0.0651	0.0743	0.3329
AC	28	0.1852	0.0634	0.0660	0.2784

Source: Own calculations based on EUROSTAT data

EURO: Belgium, Germany, Greece, Spain, France, Italy, The Netherlands, Austria, Portugal, Finland

AC: the Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Slovenia, Slovakia

Table 3: Sectoral shares differentials in the euro area and CE-EU-8 countries , 1990-2003

in percent

NACE_6 sectors	EURO	AC	EURO + AC
a+b	3.13	6.36	4.84
c+d+e	23.54	29.56	26.74
f	6.02	6.06	6.06
g+h+i	22.48	25.94	24.33
j+k	23.01	14.87	18.70
l+m+n+o+p	21.81	17.48	19.49

Source: Own calculations based on EUROSTAT data

EURO: Belgium, Germany, Greece, Spain, France, Italy, The Netherlands, Austria, Portugal, Finland

AC: the Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Slovenia, Slovakia

a+b: Agriculture, hunting and forestry; Fishing

c+d+e: Mining, quarrying; Manufacturing; Electricity, gas, and water supply

f: Construction

g+h+i: Wholesale and retail trade; Repair of motor vehicles, motorcycles and personal and household goods; Hotels and restaurants; Transport, storage and communication

j+k: Financial intermediation; Real estate, renting and business activities

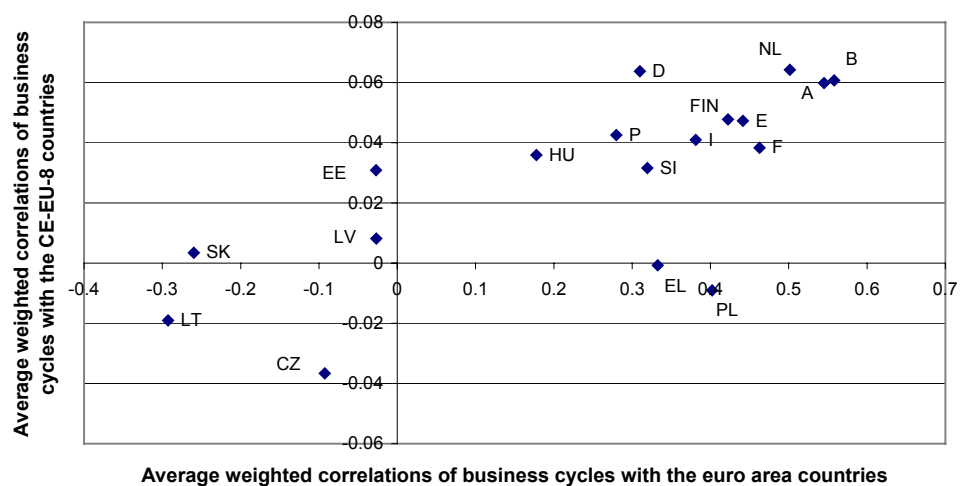
l+m+n+o+p: Public administration and defence, Compulsory social security; Education; Health and social work; Other community, social, personal service activities; Private households with employed persons

Table 4: Summary Statistics for Bilateral Trade Intensity between the euro area and CE-EU-8 countries, 1990:1-2003:3

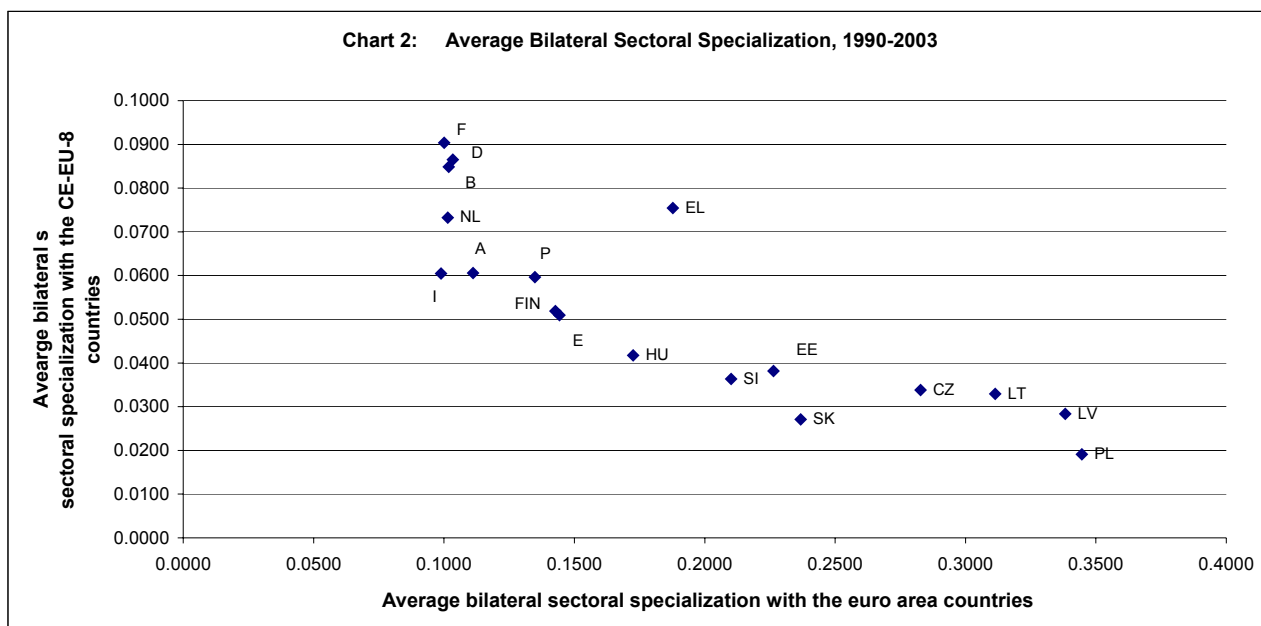
Country pairs	Observations	Mean	Standard deviation	Min	Max
All pairs	153	0.0133	0.0268	0.0001	0.1833
EURO_AC	80	0.0035	0.0053	0.001	0.0271
EURO	45	0.0325	0.0407	0.0023	0.1833
AC	28	0.0102	0.0186	0.0001	0.0713

Source: Own calculations based on EUROSTAT data

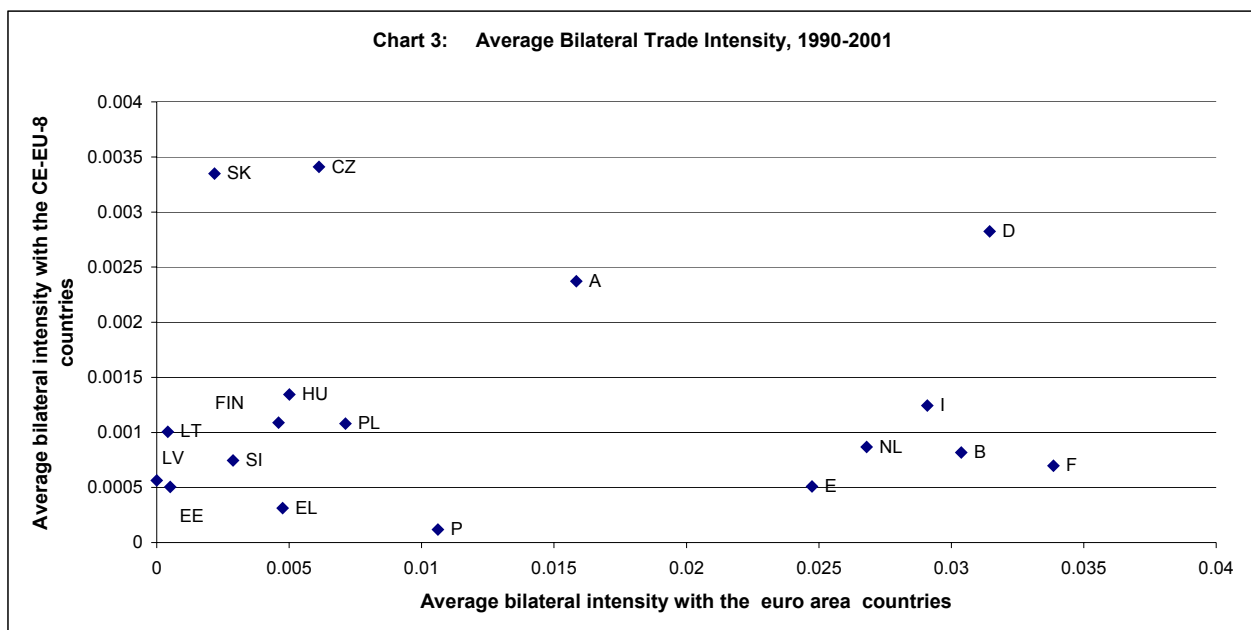
Chart 1: Correlations of Business Cycles, 1990:1-2003:3



B = Belgium; D = Germany; EL = Greece; E = Spain; F = France; I = Italy; NL = the Netherlands; A = Austria; P = Portugal; FIN = Finland; CZ = the Czech Republic; EE = Estonia; HU = Hungary; LT = Lithuania; LV = Latvia; PL = Poland; SI = Slovenia; SK = Slovakia



B = Belgium; D = Germany; EL = Greece; E = Spain; F = France; I = Italy; NL = the Netherlands; A = Austria; P = Portugal; FIN = Finland; CZ = the Czech Republic; EE = Estonia; HU = Hungary; LT = Lithuania; LV = Latvia; PL = Poland; SI = Slovenia; SK = Slovakia



Belgium; D = Germany; EL = Greece; E = Spain; F = France; I = Italy; NL = the Netherlands; A = Austria; P = Portugal; FIN = Finland; CZ = the Czech Republic; EE = Estonia; HU = Hungary; LT = Lithuania; LV = Latvia; PL = Poland; SI = Slovenia; SK = Slovakia

Table 5: OLS estimates for bilateral correlations of business cycles, various country-pairs

	Euro_10 + AC_8	Euro_8, AC_8 Greece and Portugal excluded	Euro_9, AC_8 Germany excluded	Euro_10, AC_7 Poland excluded
EURO _{ij}	0.5862*** (0.0491)	0.6382*** (0.0528)	0.6268*** (0.0502)	0.6612*** (0.0462)
AC _{ij}	0.1023 (0.0813)	0.0724 (0.0840)	0.1105 (0.0818)	0.2298** (0.0926)
Constant	0.0098 (0.0386)	0.0396 (0.0438)	0.0016 (0.0396)	-0.0652* (0.0348)
N	153	120	136	136
R ²	0.4021	0.4022	0.4245	0.5260

Robust standard errors in parentheses. *, **, *** denote significance at 10, 5 and 1 percent levels

Table 6: Estimates for bilateral correlations of business cycles, all country-pairs

	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV
ln SPEC _{ij}	-0.3462*** (0.0637)	-0.5810*** (0.1030)			-0.2015*** (0.0685)	-0.2223* (0.1269)
L n TRADE _{ij}			0.1078*** (0.0139)	0.1550*** (0.0193)	0.0843*** (0.0167)	0.1225*** (0.0263)
Constant	-0.3220*** (0.1028)	-0.6767*** (0.1642)	-0.8210*** (0.0867)	1.0921*** (0.1123)	0.3812** (0.1861)	0.5696* (0.3184)
Durbin-Wu-Hausman test		F (1, 150) = 12.86*** Prob >F =0.0005		F(1,150) = 13.66*** Prob >F = 0.0003		F(2,148) = 5.81*** Prob > F=0.0037
N	153	153	153	153	153	153
R ²	0.1620	0.0875	0.2310	0.1868	0.2749	0.2416

Cyclical components of real GDP obtained with the Baxter- King filter

Robust standard errors in parentheses. *, **, *** denote significance at 10, 5 and 1 percent levels

Table 7: Estimates for bilateral sectoral specialization and trade intensity, all country-pairs

	ln SPEC_{ij}	ln TRADE_{ij}
EURO _{ij}	-0.8507*** (0.0892)	1.5933*** (0.2832)
ln POP _i *POP _j	0.0094*** (0.0036)	-0.0181** (0.0085)
ln GDP _i *GDP _j	0.0830*** (0.0144)	0.2385*** (0.0648)
ln DIST _{ij}	0.0865 (0.0562)	-0.7115*** (0.2288)
BORDER _{ij}	-0.2820*** (0.1094)	0.8774** (0.3758)
Constant	-3.8976*** (0.5096)	-6.2797** (2.4322)
N	153	153
R ²	0.4410	0.6014

Robust standard errors in parentheses. *, **, *** denote significance at 10, 5 and 1 percent levels

Table 8: Estimates for bilateral correlations of business cycles, Greece and Portugal excluded

	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV
ln SPEC _{ij}	-0.3338*** (0.0740)	-0.5543*** (0.1110)			-0.1845*** (0.0768)	-0.3532*** (0.1265)
ln TRADE _{ij}			0.1150*** (0.0166)	0.1257*** (0.0206)	0.0935*** (0.0167)	0.0831*** (0.0255)
Constant	-0.3016** (0.1193)	-0.6366*** (0.1780)	0.8771*** (0.1029)	0.9398*** (0.1265)	0.4713** (0.2138)	0.1547 (0.3183)
Durbin-Wu-Hausman test		F (1, 117) = 10.48*** Prob >F =0.0016		F(1,117) = 0.69 Prob >F = 0.4069		F(2,115) = 3.00** Prob > F=0.0539
N	120	120	120	120	120	120
R ²	0.1530	0.0862	0.2489	0.2468	0.2870	0.2536

Cyclical components of real GDP obtained with the Baxter- King filter

Robust standard errors in parentheses. *, **, *** denote significance at 10, 5 and 1 percent levels

Table 9: Estimates for bilateral sectoral specialization and trade intensity, Greece and Portugal excluded

	ln SPEC_{ij}	ln TRADE_{ij}
EURO _{ij}	-0.9753*** (0.0956)	1.3048*** (0.2747)
lnPOP _i *POP _j	0.0089** (0.0037)	-0.0140* (0.0073)
ln GDP _i *GDP _j	0.0938*** (0.0151)	0.2976*** (0.0644)
lnDIST _{ij}	0.0413 (0.0691)	-1.1656*** (0.2336)
BORDER _{ij}	-0.2709** (0.1171)	0.4518 (0.3723)
Constant	-3.8170*** (0.5396)	-4.5151* (2.5346)
N	120	120
R ²	0.4666	0.6829

Robust standard errors in parentheses. *, **, *** denote significance at 10, 5 and 1 percent levels

Table 10: Estimates for bilateral correlations of business cycles, Germany excluded

	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV
ln SPEC _{ij}	-0.3371*** (0.0688)	-0.5804*** (0.1102)			-0.1864** (0.0782)	-0.1929 (0.1464)
ln TRADE _{ij}			0.1065*** (0.0160)	0.1620*** (0.0245)	0.0827*** (0.0204)	0.1286*** (0.0352)
Constant	-0.3256*** (0.1119)	-0.6980*** (0.1761)	0.8212*** (0.1040)	1.1498*** (0.1485)	0.3949* (0.2275)	0.6570 (0.4052)
Durbin-Wu-Hausman test		F(1,133) = 11.82*** Prob>F = 0.0008		F(1,133) = 11.92*** Prob > F = 0.0007		F(2,131) = 4.65** Prob > F = 0.0112
N	136	136	136	136	136	136
R ²	0.1479	0.0709	0.2106	0.1535	0.2453	0.2046

Cyclical components of real GDP obtained with the Baxter- King filter

Robust standard errors in parentheses. *, **, *** denote significance at 10, 5 and 1 percent levels

Table 11: Estimates for bilateral sectoral specialization and trade intensity, Germany excluded

	ln SPEC_{ij}	ln TRADE_{ij}
EURO _{ij}	-0.8241*** (0.0896)	1.5793*** (0.2972)
lnPOP _i *POP _j	0.0124*** (0.0034)	-0.0171* (0.0089)
ln GDP _i *GDP _j	0.0682*** (0.0154)	0.2332*** (0.0715)
lnDIST _{ij}	0.0995* (0.0586)	-0.7020*** (0.2398)
BORDER _{ij}	-0.2889** (0.1163)	1.0040** (0.4510)
Constant	-3.7504*** (0.5150)	-6.2631** (0.4510)
N	136	136
R ²	0.4568	0.5580

Robust standard errors in parentheses. *, **, *** denote significance at 10, 5 and 1 percent levels

Table 12: Estimates for bilateral correlations of business cycles, Poland excluded

	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV
ln SPEC _{ij}	-0.5054*** (0.0584)	-0.8713*** (0.1163)			-0.3709*** (0.0727)	-0.5216*** (0.1700)
ln TRADE _{ij}			0.1010*** (0.0139)	0.1685*** (0.0197)	0.0626*** (0.0173)	0.0877*** (0.0310)
Constant	0.5889*** (0.0913)	-1.1522*** (0.1811)	0.8269*** (0.0868)	1.1661*** (0.1139)	-0.0190 (0.1964)	-0.1051 (0.4167)
Durbin-Wu-Hausman test		F(1,133)= 25.33*** Prob >F= 0.0000		F(1,133) = 24.73*** Prob > F = 0.0000		F(2, 133) = 10.67*** Prob>F = 0.0001
N	136	136	136	136	136	136
R ²	0.3232	0.1537	0.2574	0.1846	0.3836	0.3208

Cyclical components of real GDP obtained with the Baxter- King filter

Robust standard errors in parentheses. *, **, *** denote significance at 10, 5 and 1 percent levels

Table 13: Estimates for bilateral sectoral specialization and trade intensity, Poland excluded

	ln SPEC_{ij}	ln TRADE_{ij}
EURO _{ij}	-0.7610*** (0.0100)	1.8850*** (0.3222)
lnPOP _i *POP _j	0.0087** (0.0037)	-0.0168* (0.0088)
ln GDP _i *GDP _j	0.0650*** (0.0165)	0.1944*** (0.0741)
lnDIST _{ij}	0.0698 (0.0581)	-0.7415*** (0.2425)
BORDER _{ij}	-0.3075** (0.1251)	0.8470** (0.4377)
Constant	-3.3845*** (0.5427)	-5.2578* (2.6712)
N	136	136
R ²	0.4037	0.6182

Robust standard errors in parentheses. *, **, *** denote significance at 10, 5 and 1 percent levels

Appendix

A1: Time Coverage for Gross Domestic Product and Sectoral Gross Value Added Data

Country	Gross Domestic Product (GDP) quarterly, 1995 prices, million Euro	Gross Value Added (GVA), NACE_6 sectors, quarterly, 1995 prices, million national currency
Belgium	1990:1-2003:3	1990:1-2003:2
Germany	1991:1-2003:3	1991:1-2003:3
Greece	1990:1-2003:3	1995-2000 ^a
Spain	1990:1-2003:3	1990:1-2003:3
France	1990:1-2003:3	1990:1-2003:2
Italy	1990:1-2003:3	1990:1-2003:2
The Netherlands	1990:1-2003:3	1990:1-2003:3
Austria	1990:1-2003:3	1990:1-2003:2
Portugal	1995:1-2003:3	1995-2000 ^a
Finland	1990:1-2003:3	1990:1-2003:2
The Czech Republic	1994:1-2003:2	1994:1-2003:2
Estonia	1993:1-2003:3	1993:1-2003:2
Hungary	1995:1-2002:4	1995:1-2002:2
Lithuania	1993:1-2003:3	1995:1-2003:2
Latvia	1993:1-2003:3	1990:1-2003:2
Poland	1995:1-2003:2	1995:1-2002:2
Slovenia	1992:1-2003:2	1992:1-2003:2
Slovakia	1992:1-2003:3	1994:1-2003:2

^a: annual data

Data source: EUROSTAT

A2: Codes and Description of the NACE_6 Sectors

Codes	Sector Description
a + b	Agriculture, hunting, and forestry; Fishing
c + d + e	Mining and quarrying; Manufacturing; Electricity, gas and water supply
f	Construction
g + h + i	Wholesale and retail trade, repair of motor vehicles, motorcycles and personal household goods; Hotels and restaurants; Transport, storage and communication
j + k	Financial intermediation; Real estate, renting, and business activities
l + m + n + o + p	Public administration and defence, compulsory social security; Education; Health and social work; Other community, social, personal service activities; Private households with employed persons.

2008		
B01-08	Euro-Diplomatie durch gemeinsame „Wirtschaftsregierung“	<i>Martin Seidel</i>
2007		
B03-07	Löhne und Steuern im Systemwettbewerb der Mitgliedstaaten der Europäischen Union	<i>Martin Seidel</i>
B02-07	Konsolidierung und Reform der Europäischen Union	<i>Martin Seidel</i>
B01-07	The Ratification of European Treaties - Legal and Constitutional Basis of a European Referendum.	<i>Martin Seidel</i>
2006		
B03-06	Financial Frictions, Capital Reallocation, and Aggregate Fluctuations	<i>Jürgen von Hagen, Haiping Zhang</i>
B02-06	Financial Openness and Macroeconomic Volatility	<i>Jürgen von Hagen, Haiping Zhang</i>
B01-06	A Welfare Analysis of Capital Account Liberalization	<i>Jürgen von Hagen, Haiping Zhang</i>
2005		
B11-05	Das Kompetenz- und Entscheidungssystem des Vertrages von Rom im Wandel seiner Funktion und Verfassung	<i>Martin Seidel</i>
B10-05	Die Schutzklauseln der Beitrittsverträge	<i>Martin Seidel</i>
B09-05	Measuring Tax Burdens in Europe	<i>Guntram B. Wolff</i>
B08-05	Remittances as Investment in the Absence of Altruism	<i>Gabriel González-König</i>
B07-05	Economic Integration in a Multicore World?	<i>Christian Volpe Martincus, Jennifer Pédussel Wu</i>
B06-05	Banking Sector (Under?)Development in Central and Eastern Europe	<i>Jürgen von Hagen, Valeriya Dinger</i>
B05-05	Regulatory Standards Can Lead to Predation	<i>Stefan Lutz</i>
B04-05	Währungspolitik als Sozialpolitik	<i>Martin Seidel</i>
B03-05	Public Education in an Integrated Europe: Studying to Migrate and Teaching to Stay?	<i>Panu Poutvaara</i>
B02-05	Voice of the Diaspora: An Analysis of Migrant Voting Behavior	<i>Jan Fidrmuc, Orla Doyle</i>
B01-05	Macroeconomic Adjustment in the New EU Member States	<i>Jürgen von Hagen, Iulia Traistaru</i>
2004		
B33-04	The Effects of Transition and Political Instability On Foreign Direct Investment Inflows: Central Europe and the Balkans	<i>Josef C. Brada, Ali M. Kutan, Tanner M. Yigit</i>
B32-04	The Choice of Exchange Rate Regimes in Developing Countries: A Multinomial Panel Analysis	<i>Jürgen von Hagen, Jizhong Zhou</i>
B31-04	Fear of Floating and Fear of Pegging: An Empirical Analysis of De Facto Exchange Rate Regimes in Developing Countries	<i>Jürgen von Hagen, Jizhong Zhou</i>
B30-04	Der Vollzug von Gemeinschaftsrecht über die Mitgliedstaaten und seine Rolle für die EU und den Beitrittsprozess	<i>Martin Seidel</i>
B29-04	Deutschlands Wirtschaft, seine Schulden und die Unzulänglichkeiten der einheitlichen Geldpolitik im Eurosystem	<i>Dieter Spethmann, Otto Steiger</i>
B28-04	Fiscal Crises in U.S. Cities: Structural and Non-structural Causes	<i>Guntram B. Wolff</i>
B27-04	Firm Performance and Privatization in Ukraine	<i>Galyna Grygorenko, Stefan Lutz</i>
B26-04	Analyzing Trade Opening in Ukraine: Effects of a Customs Union with the EU	<i>Oksana Harbuzyuk, Stefan Lutz</i>
B25-04	Exchange Rate Risk and Convergence to the Euro	<i>Lucjan T. Orlowski</i>
B24-04	The Endogeneity of Money and the Eurosystem	<i>Otto Steiger</i>
B23-04	Which Lender of Last Resort for the Eurosystem?	<i>Otto Steiger</i>
B22-04	Non-Discretionary Monetary Policy: The Answer for Transition Economies?	<i>Elham-Mafi Kreft, Steven F. Kreft</i>
B21-04	The Effectiveness of Subsidies Revisited: Accounting for Wage and Employment Effects in Business R+D	<i>Volker Reintaler, Guntram B. Wolff</i>
B20-04	Money Market Pressure and the Determinants of Banking Crises	<i>Jürgen von Hagen, Tai-kuang Ho</i>
B19-04	Die Stellung der Europäischen Zentralbank nach dem Verfassungsvertrag	<i>Martin Seidel</i>

B18-04	Transmission Channels of Business Cycles Synchronization in an Enlarged EMU	<i>Iulia Traistaru</i>
B17-04	Foreign Exchange Regime, the Real Exchange Rate and Current Account Sustainability: The Case of Turkey	<i>Sübüdey Togan, Hasan Ersel</i>
B16-04	Does It Matter Where Immigrants Work? Traded Goods, Non-traded Goods, and Sector Specific Employment	<i>Harry P. Bowen, Jennifer Pédussel Wu</i>
B15-04	Do Economic Integration and Fiscal Competition Help to Explain Local Patterns?	<i>Christian Volpe Martincus</i>
B14-04	Euro Adoption and Maastricht Criteria: Rules or Discretion?	<i>Jiri Jonas</i>
B13-04	The Role of Electoral and Party Systems in the Development of Fiscal Institutions in the Central and Eastern European Countries	<i>Sami Yläoutinen</i>
B12-04	Measuring and Explaining Levels of Regional Economic Integration	<i>Jennifer Pédussel Wu</i>
B11-04	Economic Integration and Location of Manufacturing Activities: Evidence from MERCOSUR	<i>Pablo Sanguinetti, Iulia Traistaru, Christian Volpe Martincus</i>
B10-04	Economic Integration and Industry Location in Transition Countries	<i>Laura Resmini</i>
B09-04	Testing Creditor Moral Hazard in Sovereign Bond Markets: A Unified Theoretical Approach and Empirical Evidence	<i>Ayşe Y. Evrensel, Ali M. Kutan</i>
B08-04	European Integration, Productivity Growth and Real Convergence	<i>Taner M. Yigit, Ali M. Kutan</i>
B07-04	The Contribution of Income, Social Capital, and Institutions to Human Well-being in Africa	<i>Mina Balamoune-Lutz, Stefan H. Lutz</i>
B06-04	Rural Urban Inequality in Africa: A Panel Study of the Effects of Trade Liberalization and Financial Deepening	<i>Mina Balamoune-Lutz, Stefan H. Lutz</i>
B05-04	Money Rules for the Eurozone Candidate Countries	<i>Lucjan T. Orlowski</i>
B04-04	Who is in Favor of Enlargement? Determinants of Support for EU Membership in the Candidate Countries' Referenda	<i>Orla Doyle, Jan Fidrmuc</i>
B03-04	Over- and Underbidding in Central Bank Open Market Operations Conducted as Fixed Rate Tender	<i>Ulrich Bindseil</i>
B02-04	Total Factor Productivity and Economic Freedom Implications for EU Enlargement	<i>Ronald L. Moomaw, Euy Seok Yang</i>
B01-04	Die neuen Schutzklauseln der Artikel 38 und 39 des Beitrittsvertrages: Schutz der alten Mitgliedstaaten vor Störungen durch die neuen Mitgliedstaaten	<i>Martin Seidel</i>
2003		
B29-03	Macroeconomic Implications of Low Inflation in the Euro Area	<i>Jürgen von Hagen, Boris Hofmann</i>
B28-03	The Effects of Transition and Political Instability on Foreign Direct Investment: Central Europe and the Balkans	<i>Josef C. Brada, Ali M. Kutan, Taner M. Yigit</i>
B27-03	The Performance of the Euribor Futures Market: Efficiency and the Impact of ECB Policy Announcements (Electronic Version of International Finance)	<i>Kerstin Bernoth, Juergen von Hagen</i>
B26-03	Sovereign Risk Premia in the European Government Bond Market (überarbeitete Version zum Herunterladen)	<i>Kerstin Bernoth, Juergen von Hagen, Ludger Schulknecht</i>
B25-03	How Flexible are Wages in EU Accession Countries?	<i>Anna Iara, Iulia Traistaru</i>
B24-03	Monetary Policy Reaction Functions: ECB versus Bundesbank	<i>Bernd Hayo, Boris Hofmann</i>
B23-03	Economic Integration and Manufacturing Concentration Patterns: Evidence from Mercosur	<i>Iulia Traistaru, Christian Volpe Martincus</i>
B22-03	Reformzwänge innerhalb der EU angesichts der Osterweiterung	<i>Martin Seidel</i>
B21-03	Reputation Flows: Contractual Disputes and the Channels for Inter-Firm Communication	<i>William Pyle</i>
B20-03	Urban Primacy, Gigantism, and International Trade: Evidence from Asia and the Americas	<i>Ronald L. Moomaw, Mohammed A. Alwosabi</i>
B19-03	An Empirical Analysis of Competing Explanations of Urban Primacy Evidence from Asia and the Americas	<i>Ronald L. Moomaw, Mohammed A. Alwosabi</i>

B18-03	The Effects of Regional and Industry-Wide FDI Spillovers on Export of Ukrainian Firms	<i>Stefan H. Lutz, Oleksandr Talavera, Sang-Min Park</i>
B17-03	Determinants of Inter-Regional Migration in the Baltic States	<i>Mihails Hazans</i>
B16-03	South-East Europe: Economic Performance, Perspectives, and Policy Challenges	<i>Iulia Traistaru, Jürgen von Hagen</i>
B15-03	Employed and Unemployed Search: The Marginal Willingness to Pay for Attributes in Lithuania, the US and the Netherlands	<i>Jos van Ommeren, Mihails Hazans</i>
B14-03	FCIs and Economic Activity: Some International Evidence	<i>Charles Goodhart, Boris Hofmann</i>
B13-03	The IS Curve and the Transmission of Monetary Policy: Is there a Puzzle?	<i>Charles Goodhart, Boris Hofmann</i>
B12-03	What Makes Regions in Eastern Europe Catching Up? The Role of Foreign Investment, Human Resources, and Geography	<i>Gabriele Tondl, Goran Vuksic</i>
B11-03	Die Weisungs- und Herrschaftsmacht der Europäischen Zentralbank im europäischen System der Zentralbanken - eine rechtliche Analyse	<i>Martin Seidel</i>
B10-03	Foreign Direct Investment and Perceptions of Vulnerability to Foreign Exchange Crises: Evidence from Transition Economies	<i>Josef C. Brada, Vladimír Tomsík</i>
B09-03	The European Central Bank and the Eurosystem: An Analysis of the Missing Central Monetary Institution in European Monetary Union	<i>Gunnar Heinsohn, Otto Steiger</i>
B08-03	The Determination of Capital Controls: Which Role Do Exchange Rate Regimes Play?	<i>Jürgen von Hagen, Jizhong Zhou</i>
B07-03	Nach Nizza und Stockholm: Stand des Binnenmarktes und Prioritäten für die Zukunft	<i>Martin Seidel</i>
B06-03	Fiscal Discipline and Growth in Euroland. Experiences with the Stability and Growth Pact	<i>Jürgen von Hagen</i>
B05-03	Reconsidering the Evidence: Are Eurozone Business Cycles Converging?	<i>Michael Massmann, James Mitchell</i>
B04-03	Do Ukrainian Firms Benefit from FDI?	<i>Stefan H. Lutz, Oleksandr Talavera</i>
B03-03	Europäische Steuerkoordination und die Schweiz	<i>Stefan H. Lutz</i>
B02-03	Commuting in the Baltic States: Patterns, Determinants, and Gains	<i>Mihails Hazans</i>
B01-03	Die Wirtschafts- und Währungsunion im rechtlichen und politischen Gefüge der Europäischen Union	<i>Martin Seidel</i>
2002		
B30-02	An Adverse Selection Model of Optimal Unemployment Assurance	<i>Marcus Hagedorn, Ashok Kaul, Tim Mennel</i>
B29B-02	Trade Agreements as Self-protection	<i>Jennifer Pédussel Wu</i>
B29A-02	Growth and Business Cycles with Imperfect Credit Markets	<i>Debajyoti Chakrabarty</i>
B28-02	Inequality, Politics and Economic Growth	<i>Debajyoti Chakrabarty</i>
B27-02	Poverty Traps and Growth in a Model of Endogenous Time Preference	<i>Debajyoti Chakrabarty</i>
B26-02	Monetary Convergence and Risk Premiums in the EU Candidate Countries	<i>Lucjan T. Orłowski</i>
B25-02	Trade Policy: Institutional Vs. Economic Factors	<i>Stefan Lutz</i>
B24-02	The Effects of Quotas on Vertical Intra-industry Trade	<i>Stefan Lutz</i>
B23-02	Legal Aspects of European Economic and Monetary Union	<i>Martin Seidel</i>
B22-02	Der Staat als <i>Lender of Last Resort</i> - oder: Die Achillesverse des Eurosystems	<i>Otto Steiger</i>
B21-02	Nominal and Real Stochastic Convergence Within the Transition Economies and to the European Union: Evidence from Panel Data	<i>Ali M. Kutan, Taner M. Yigit</i>
B20-02	The Impact of News, Oil Prices, and International Spillovers on Russian Financial Markets	<i>Bernd Hayo, Ali M. Kutan</i>

B19-02	East Germany: Transition with Unification, Experiments and Experiences	<i>Jürgen von Hagen, Rolf R. Strauch, Guntram B. Wolff</i>
B18-02	Regional Specialization and Employment Dynamics in Transition Countries	<i>Iulia Traistaru, Guntram B. Wolff</i>
B17-02	Specialization and Growth Patterns in Border Regions of Accession Countries	<i>Laura Resmini</i>
B16-02	Regional Specialization and Concentration of Industrial Activity in Accession Countries	<i>Iulia Traistaru, Peter Nijkamp, Simonetta Longhi</i>
B15-02	Does Broad Money Matter for Interest Rate Policy?	<i>Matthias Brückner, Andreas Schaber</i>
B14-02	The Long and Short of It: Global Liberalization, Poverty and Inequality	<i>Christian E. Weller, Adam Hersch</i>
B13-02	De Facto and Official Exchange Rate Regimes in Transition Economies	<i>Jürgen von Hagen, Jizhong Zhou</i>
B12-02	Argentina: The Anatomy of A Crisis	<i>Jiri Jonas</i>
B11-02	The Eurosystem and the Art of Central Banking	<i>Gunnar Heinsohn, Otto Steiger</i>
B10-02	National Origins of European Law: Towards an Autonomous System of European Law?	<i>Martin Seidel</i>
B09-02	Monetary Policy in the Euro Area - Lessons from the First Years	<i>Volker Clausen, Bernd Hayo</i>
B08-02	Has the Link Between the Spot and Forward Exchange Rates Broken Down? Evidence From Rolling Cointegration Tests	<i>Ali M. Kutan, Su Zhou</i>
B07-02	Perspektiven der Erweiterung der Europäischen Union	<i>Martin Seidel</i>
B06-02	Is There Asymmetry in Forward Exchange Rate Bias? Multi-Country Evidence	<i>Su Zhou, Ali M. Kutan</i>
B05-02	Real and Monetary Convergence Within the European Union and Between the European Union and Candidate Countries: A Rolling Cointegration Approach	<i>Josef C. Brada, Ali M. Kutan, Su Zhou</i>
B04-02	Asymmetric Monetary Policy Effects in EMU	<i>Volker Clausen, Bernd Hayo</i>
B03-02	The Choice of Exchange Rate Regimes: An Empirical Analysis for Transition Economies	<i>Jürgen von Hagen, Jizhong Zhou</i>
B02-02	The Euro System and the Federal Reserve System Compared: Facts and Challenges	<i>Karlheinz Ruckriegel, Franz Seitz</i>
B01-02	Does Inflation Targeting Matter?	<i>Manfred J. M. Neumann, Jürgen von Hagen</i>
2001		
B29-01	Is Kazakhstan Vulnerable to the Dutch Disease?	<i>Karlygash Kuralbayeva, Ali M. Kutan, Michael L. Wyzan</i>
B28-01	Political Economy of the Nice Treaty: Rebalancing the EU Council. The Future of European Agricultural Policies	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B27-01	Investor Panic, IMF Actions, and Emerging Stock Market Returns and Volatility: A Panel Investigation	<i>Bernd Hayo, Ali M. Kutan</i>
B26-01	Regional Effects of Terrorism on Tourism: Evidence from Three Mediterranean Countries	<i>Konstantinos Drakos, Ali M. Kutan</i>
B25-01	Monetary Convergence of the EU Candidates to the Euro: A Theoretical Framework and Policy Implications	<i>Lucjan T. Orlowski</i>
B24-01	Disintegration and Trade	<i>Jarko and Jan Fidrmuc</i>
B23-01	Migration and Adjustment to Shocks in Transition Economies	<i>Jan Fidrmuc</i>
B22-01	Strategic Delegation and International Capital Taxation	<i>Matthias Brückner</i>
B21-01	Balkan and Mediterranean Candidates for European Union Membership: The Convergence of Their Monetary Policy With That of the European Central Bank	<i>Josef C. Brada, Ali M. Kutan</i>
B20-01	An Empirical Inquiry of the Efficiency of Intergovernmental Transfers for Water Projects Based on the WRDA Data	<i>Anna Rubinchik-Pessach</i>
B19-01	Detrending and the Money-Output Link: International Evidence	<i>R.W. Hafer, Ali M. Kutan</i>

B18-01	Monetary Policy in Unknown Territory. The European Central Bank in the Early Years	<i>Jürgen von Hagen, Matthias Brückner</i>
B17-01	Executive Authority, the Personal Vote, and Budget Discipline in Latin American and Caribbean Countries	<i>Mark Hallerberg, Patrick Marier</i>
B16-01	Sources of Inflation and Output Fluctuations in Poland and Hungary: Implications for Full Membership in the European Union	<i>Selahattin Dibooglu, Ali M. Kutan</i>
B15-01	Programs Without Alternative: Public Pensions in the OECD	<i>Christian E. Weller</i>
B14-01	Formal Fiscal Restraints and Budget Processes As Solutions to a Deficit and Spending Bias in Public Finances - U.S. Experience and Possible Lessons for EMU	<i>Rolf R. Strauch, Jürgen von Hagen</i>
B13-01	German Public Finances: Recent Experiences and Future Challenges	<i>Jürgen von Hagen, Rolf R. Strauch</i>
B12-01	The Impact of Eastern Enlargement On EU-Labour Markets. Pensions Reform Between Economic and Political Problems	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B11-01	Inflationary Performance in a Monetary Union With Large Wage Setters	<i>Lilia Cavallar</i>
B10-01	Integration of the Baltic States into the EU and Institutions of Fiscal Convergence: A Critical Evaluation of Key Issues and Empirical Evidence	<i>Ali M. Kutan, Niina Pautola-Mol</i>
B09-01	Democracy in Transition Economies: Grease or Sand in the Wheels of Growth?	<i>Jan Fidrmuc</i>
B08-01	The Functioning of Economic Policy Coordination	<i>Jürgen von Hagen, Susanne Mundschenk</i>
B07-01	The Convergence of Monetary Policy Between Candidate Countries and the European Union	<i>Josef C. Brada, Ali M. Kutan</i>
B06-01	Opposites Attract: The Case of Greek and Turkish Financial Markets	<i>Konstantinos Drakos, Ali M. Kutan</i>
B05-01	Trade Rules and Global Governance: A Long Term Agenda. The Future of Banking.	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B04-01	The Determination of Unemployment Benefits	<i>Rafael di Tella, Robert J. McCulloch</i>
B03-01	Preferences Over Inflation and Unemployment: Evidence from Surveys of Happiness	<i>Rafael di Tella, Robert J. McCulloch, Andrew J. Oswald</i>
B02-01	The Konstanz Seminar on Monetary Theory and Policy at Thirty	<i>Michele Fratianni, Jürgen von Hagen</i>
B01-01	Divided Boards: Partisanship Through Delegated Monetary Policy	<i>Etienne Farvaque, Gael Lagadec</i>
2000		
B20-00	Breakin-up a Nation, From the Inside	<i>Etienne Farvaque</i>
B19-00	Income Dynamics and Stability in the Transition Process, general Reflections applied to the Czech Republic	<i>Jens Hölscher</i>
B18-00	Budget Processes: Theory and Experimental Evidence	<i>Karl-Martin Ehrhart, Roy Gardner, Jürgen von Hagen, Claudia Keser</i>
B17-00	Rückführung der Landwirtschaftspolitik in die Verantwortung der Mitgliedsstaaten? - Rechts- und Verfassungsfragen des Gemeinschaftsrechts	<i>Martin Seidel</i>
B16-00	The European Central Bank: Independence and Accountability	<i>Christa Randzio-Plath, Tomasso Padoa-Schioppa</i>
B15-00	Regional Risk Sharing and Redistribution in the German Federation	<i>Jürgen von Hagen, Ralf Hepp</i>
B14-00	Sources of Real Exchange Rate Fluctuations in Transition Economies: The Case of Poland and Hungary	<i>Selahattin Dibooglu, Ali M. Kutan</i>
B13-00	Back to the Future: The Growth Prospects of Transition Economies Reconsidered	<i>Nauro F. Campos</i>

B12-00	Rechtsetzung und Rechtsangleichung als Folge der Einheitlichen Europäischen Währung	<i>Martin Seidel</i>
B11-00	A Dynamic Approach to Inflation Targeting in Transition Economies	<i>Lucjan T. Orłowski</i>
B10-00	The Importance of Domestic Political Institutions: Why and How Belgium Qualified for EMU	<i>Marc Hallerberg</i>
B09-00	Rational Institutions Yield Hysteresis	<i>Rafael Di Tella, Robert MacCulloch</i>
B08-00	The Effectiveness of Self-Protection Policies for Safeguarding Emerging Market Economies from Crises	<i>Kenneth Kletzer</i>
B07-00	Financial Supervision and Policy Coordination in The EMU	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B06-00	The Demand for Money in Austria	<i>Bernd Hayo</i>
B05-00	Liberalization, Democracy and Economic Performance during Transition	<i>Jan Fidrmuc</i>
B04-00	A New Political Culture in The EU - Democratic Accountability of the ECB	<i>Christa Randzio-Plath</i>
B03-00	Integration, Disintegration and Trade in Europe: Evolution of Trade Relations during the 1990's	<i>Jarko Fidrmuc, Jan Fidrmuc</i>
B02-00	Inflation Bias and Productivity Shocks in Transition Economies: The Case of the Czech Republic	<i>Josef C. Brada, Arthur E. King, Ali M. Kutan</i>
B01-00	Monetary Union and Fiscal Federalism	<i>Kenneth Kletzer, Jürgen von Hagen</i>
1999		
B26-99	Skills, Labour Costs, and Vertically Differentiated Industries: A General Equilibrium Analysis	<i>Stefan Lutz, Alessandro Turrini</i>
B25-99	Micro and Macro Determinants of Public Support for Market Reforms in Eastern Europe	<i>Bernd Hayo</i>
B24-99	What Makes a Revolution?	<i>Robert MacCulloch</i>
B23-99	Informal Family Insurance and the Design of the Welfare State	<i>Rafael Di Tella, Robert MacCulloch</i>
B22-99	Partisan Social Happiness	<i>Rafael Di Tella, Robert MacCulloch</i>
B21-99	The End of Moderate Inflation in Three Transition Economies?	<i>Josef C. Brada, Ali M. Kutan</i>
B20-99	Subnational Government Bailouts in Germany	<i>Helmut Seitz</i>
B19-99	The Evolution of Monetary Policy in Transition Economies	<i>Ali M. Kutan, Josef C. Brada</i>
B18-99	Why are Eastern Europe's Banks not failing when everybody else's are?	<i>Christian E. Weller, Bernard Morzuch</i>
B17-99	Stability of Monetary Unions: Lessons from the Break-Up of Czechoslovakia	<i>Jan Fidrmuc, Julius Horvath and Jarko Fidrmuc</i>
B16-99	Multinational Banks and Development Finance	<i>Christian E. Weller and Mark J. Scher</i>
B15-99	Financial Crises after Financial Liberalization: Exceptional Circumstances or Structural Weakness?	<i>Christian E. Weller</i>
B14-99	Industry Effects of Monetary Policy in Germany	<i>Bernd Hayo and Birgit Uhlenbrock</i>
B13-99	Financial Fragility or What Went Right and What Could Go Wrong in Central European Banking?	<i>Christian E. Weller and Jürgen von Hagen</i>
B12-99	Size Distortions of Tests of the Null Hypothesis of Stationarity: Evidence and Implications for Applied Work	<i>Mehmet Caner and Lutz Kilian</i>
B11-99	Financial Supervision and Policy Coordination in the EMU	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B10-99	Financial Liberalization, Multinational Banks and Credit Supply: The Case of Poland	<i>Christian Weller</i>
B09-99	Monetary Policy, Parameter Uncertainty and Optimal Learning	<i>Volker Wieland</i>
B08-99	The Connection between more Multinational Banks and less Real Credit in Transition Economies	<i>Christian Weller</i>

B07-99	Comovement and Catch-up in Productivity across Sectors: Evidence from the OECD	<i>Christopher M. Cornwell and Jens-Uwe Wächter</i>
B06-99	Productivity Convergence and Economic Growth: A Frontier Production Function Approach	<i>Christopher M. Cornwell and Jens-Uwe Wächter</i>
B05-99	Tumbling Giant: Germany's Experience with the Maastricht Fiscal Criteria	<i>Jürgen von Hagen and Rolf Strauch</i>
B04-99	The Finance-Investment Link in a Transition Economy: Evidence for Poland from Panel Data	<i>Christian Weller</i>
B03-99	The Macroeconomics of Happiness	<i>Rafael Di Tella, Robert McCulloch and Andrew J. Oswald</i>
B02-99	The Consequences of Labour Market Flexibility: Panel Evidence Based on Survey Data	<i>Rafael Di Tella and Robert McCulloch</i>
B01-99	The Excess Volatility of Foreign Exchange Rates: Statistical Puzzle or Theoretical Artifact?	<i>Robert B.H. Hauswald</i>
1998		
B16-98	Labour Market + Tax Policy in the EMU	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B15-98	Can Taxing Foreign Competition Harm the Domestic Industry?	<i>Stefan Lutz</i>
B14-98	Free Trade and Arms Races: Some Thoughts Regarding EU-Russian Trade	<i>Rafael Reuveny and John Maxwell</i>
B13-98	Fiscal Policy and Intranational Risk-Sharing	<i>Jürgen von Hagen</i>
B12-98	Price Stability and Monetary Policy Effectiveness when Nominal Interest Rates are Bounded at Zero	<i>Athanasios Orphanides and Volker Wieland</i>
B11A-98	Die Bewertung der "dauerhaft tragbaren öffentlichen Finanzlage" der EU Mitgliedstaaten beim Übergang zur dritten Stufe der EWWU	<i>Rolf Strauch</i>
B11-98	Exchange Rate Regimes in the Transition Economies: Case Study of the Czech Republic: 1990-1997	<i>Julius Horvath and Jiri Jonas</i>
B10-98	Der Wettbewerb der Rechts- und politischen Systeme in der Europäischen Union	<i>Martin Seidel</i>
B09-98	U.S. Monetary Policy and Monetary Policy and the ESCB	<i>Robert L. Hetzel</i>
B08-98	Money-Output Granger Causality Revisited: An Empirical Analysis of EU Countries (überarbeitete Version zum Herunterladen)	<i>Bernd Hayo</i>
B07-98	Designing Voluntary Environmental Agreements in Europe: Some Lessons from the U.S. EPA's 33/50 Program	<i>John W. Maxwell</i>
B06-98	Monetary Union, Asymmetric Productivity Shocks and Fiscal Insurance: an Analytical Discussion of Welfare Issues	<i>Kenneth Kletzer</i>
B05-98	Estimating a European Demand for Money (überarbeitete Version zum Herunterladen)	<i>Bernd Hayo</i>
B04-98	The EMU's Exchange Rate Policy	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B03-98	Central Bank Policy in a More Perfect Financial System	<i>Jürgen von Hagen / Ingo Fender</i>
B02-98	Trade with Low-Wage Countries and Wage Inequality	<i>Jaleel Ahmad</i>
B01-98	Budgeting Institutions for Aggregate Fiscal Discipline	<i>Jürgen von Hagen</i>
1997		
B04-97	Macroeconomic Stabilization with a Common Currency: Does European Monetary Unification Create a Need for Fiscal Insurance or Federalism?	<i>Kenneth Kletzer</i>
B-03-97	Liberalising European Markets for Energy and Telecommunications: Some Lessons from the US Electric Utility Industry	<i>Tom Lyon / John Mayo</i>
B02-97	Employment and EMU	<i>Deutsch-Französisches Wirtschaftspolitisches Forum</i>
B01-97	A Stability Pact for Europe	<i>(a Forum organized by ZEI)</i>

ISSN 1436 - 6053

Zentrum für Europäische Integrationsforschung
Center for European Integration Studies
Rheinische Friedrich-Wilhelms-Universität Bonn

Walter-Flex-Strasse 3
D-53113 Bonn
Germany

Tel.: +49-228-73-1732
Fax: +49-228-73-1809
www.zei.de